Claims

1. A method for charging a deformable intraocular lens into a receptacle through a slit or opening in the receptacle periphery, the lens in un-deformed state comprising a) a roughly disc shaped optic part, defining an optic plane and a concentric optic axis normal to the plane, configured to act as a lens when inserted into an eye and b) at least two elongated haptic legs, each leg having an inner end attached to the optic part, an outer end being free and intermediate points in between the inner end and the free end, each leg being curved in unstressed state, the curvature defining a curve plane for each leg, and being flexible to at least a less curved configuration under stress, c h a r a c t e r i z e d i n the improvement that the method comprises the steps of i) stretching the legs, simultaneously or sequentially, to align the legs, simultaneously or sequentially, along a substantially straight line, ii) aligning or maintaining the substantially straight line over and substantially parallel with the slit or opening of the receptacle, and iii) transferring at least the two legs through the slit or opening into the receptacle.

2. The method of claim 1, wherein that the stretching of the legs takes place substantially simultaneously.

3. The method of claim 1, wherein the legs are aligned to point in substantially the same direction with respect to the optic part.

4. The method of claim 1, wherein the legs are aligned to point in substantially opposite directions with respect to the optic part.

5. The method of claim 1, wherein the stretching step comprises the steps of maintaining the optic part substantially fixed with respect to the line and aligning the legs by directly affecting the legs.

6. The method of claim 5, wherein the free ends of the legs are kept substantially at the line while affecting the legs in between the free ends and the inner ends.

7. The method of claim 1, wherein the stretching step comprises the step of moving the optic part.

8. The method of claim 7, wherein the optic is moved by rotation substantially around the optic axis.

9. The method of claim 8, wherein the free ends of the legs are prevented from participating in the rotation.

10. The method of claim 9, wherein the free ends are kept located along the line.

11. The method of claim 7, wherein the optic is moved in an axial movement at least partly along its optic axis.

12. The method of claim 11, wherein the optic is prevented from substantial rotation around its optic axis.

13. The method of claim 12, wherein during the axial movement the inner ends, intermediate points and the free ends of the legs are sequentially aligned with the line.

14. The method of claim 1, wherein the aligned legs along the substantially straight line are parallel with a maximum separation substantially corresponding to the unstressed optic diameter.

15. The method of claim 14, wherein the legs are brought to a position in parallel with less separation than corresponding to the optic diameter.

16. The method of claim 1, comprising the step of transferring the optic through the slit or opening into the receptacle.

17. The method of claim 16, wherein the transferring step comprises the step of folding the optic.

18. The method of claim 17, wherein the folding takes place along a folding line substantially passing through the attachment position for the inner ends of the two legs.

19. The method of claim 18, wherein the haptic legs have radial attachment to the optic.

20. The method of claim 1, wherein the receptacle is generally tube shaped with an interior duct, defining a duct axis.

21. The method of claim 20, wherein the slit or opening is an elongated slit, extending on the tube periphery substantially parallel with the duct axis.

22. The method of claim 21, wherein the slit extension along the duct axis has a minimum length substantially corresponding to the lens extension along the line after the stretching step.

23. The method of claim 20, wherein the duct diameter is less than the unstressed optic diameter.

24. The method of claim 1, wherein the slit or opening is closed after the transferring step.

25. The method of claim 1, wherein the receptacle is an implanter, or part of an implanter, designed for insertion of the lens into the eye.

26. The method of claim 25, wherein the implanter has a plunger arrangement for moving the lens.

27. The method of claim 26, wherein the plunger arrangement comprises a flexible sheet.

28. The method of claim 27, comprising the steps of placing the lens optic on the sheet.

29. The method of claim 28, comprising the step of moving the lens under compression of the lens optic.

30. The method of claim 28, wherein the lens is released under unfolding of the sheet.

31. A device for stretching the haptics of a deformable intraocular lens, the lens in undeformed state comprising a) a roughly disc shaped optic part, defining an optic plane and a concentric optic axis normal to the plane, configured to act as a lens when inserted into an eye and b) at least two elongated haptic legs, each leg having an inner end attached to the optic part, an outer end being free and intermediate points in between the inner end and the free end, each leg being curved in unstressed state, the curvature defining a curve plane for each leg, and being flexible to at least a less curved configuration under stress, c h a r a c t e r i z e d i n the improvement comprising i) at least two haptic guiding surfaces arranged for each of the at least two haptic legs, the guiding surfaces having less curvature than the legs in un-stressed state, ii) a seat for the lens arranged with respect to the guiding surfaces so as to allow, when a lens is positioned in the seat, contact between a first point on the leg and its guiding structure and iii) a lens guiding arrangement allowing the lens to be moved along a path bringing at least a second point on the leg into contact with, or closer to, its guiding structure.

32. The device of claim 31, wherein the guiding surfaces have at least one surface component perpendicular to the haptic plane, when the lens is positioned in the seat.

33. The device of claim 31, wherein the guiding surfaces have extensions in the haptic planes covering a major length, more preferably substantially the whole length between the inner end and the free end and most preferably a length corresponding to the leg length in stretched straight condition.

34. The device of claim 31, wherein the guiding surfaces are substantially straight and preferably straight.

35. The device of claim 31, wherein the guiding surfaces, when seen along and in a direction in or parallel with the haptic plane, have an inclination or ramped surface.

36. The device of claim 31, wherein the guiding surface are positioned so as to contact the inner, concave, side of the leg.

37. The device of claim 36, wherein one or more additional surfaces are placed also on the convex side.

38. The device of claim 31, wherein two guiding surfaces are arranged in an angled relationship.

39. The device of claim 31, wherein two guiding surfaces are arranged in a coinciding, parallel or aligned relationship.

40. The device of claim 39, wherein the two guiding surfaces points substantially in opposite directions.

41. The device of claim 31, wherein the lens optic is arranged movable in the optic axis direction and the guiding surfaces component in the same direction have a height covers at least a part of the lens mobility in said direction.

42. The device of claim 41, wherein the guiding surfaces have a variable height, when seen along and in a direction in or parallel with the haptic plane.

43. The device of claim 42, wherein the height decreases in directions out from the seat.

44. The device of claim 31, wherein the guiding surfaces are arranged fixed in relation to each other.

45. The device of claim 31, wherein the seat is arranged to accommodate the lens optic in substantially unstressed condition.

46. The device of claim 31, wherein the seat includes a fixture for the lens.

47. The device of claim 46, wherein the fixture comprises arrangements for stabilizing the lens haptics

48. The device of claim 31, wherein the seat is arranged fixed in relation to the guiding surfaces.

49. The device of claim 48, wherein the fixed seat is arranged to allow movement of the lens optic.

50. The device of claim 31, wherein the seat can is a part separate from the guiding surfaces.

51. The device of claim 50, wherein the seat has keying structures for cooperation with corresponding keying structures on or at the guiding surfaces or a support for the guiding surfaces.

52. The device of claim 31, wherein the lens guiding arrangement is arranged to reduce the curvature between the first point and the second point during lens movement.

53. The device of claim 31, wherein the lens guiding arrangement is arranged to allow rotation of the lens optic along a path around the optic axis.

54. The device of claim 53, wherein the seat is arranged to rotate.

55. The device of claim 53, wherein the first point is close to the leg free ends.

56. The device of claim 31, wherein the lens guiding arrangement is arranged to allow displacement of the lens optic along a path in the optic axis direction.

57. The device of claim 56, wherein the seat is arranged movable in the optic axis direction.

58. The device of claim 57, wherein the seat is arranged movable in a channel.

59. The device of claim 56, wherein the first point is close the leg inner end.

60. The device of claim 59, wherein the guiding surfaces are sloping out from the lens optic when seen in the lens movement direction.

61. The device of claim 31, wherein the device comprises handles for facilitating automated or preferably manual manipulation of the movable parts.

62. The device of claim 31, wherein the device may act as a package for the lens in stressed or preferably unstressed condition.

63. The device of claim 31, wherein the device is arranged for transfer of the lens with stretched legs to a receptacle.

64. The device of claim 63, wherein a delivery opening is arranged on the device and a reception opening on the receptacle, the delivery opening and reception opening being connectable to form a transfer opening for transfer of the lens.

65. The device of claim 64, wherein at least the reception opening can be closed.

66. The device of claim 65, wherein the delivery opening and the reception opening can be misaligned for closing.

67. The device of claim 64, wherein the transfer opening is elongated and adapted for passage of the stretched legs and the optic.

68. The device of claim 67, wherein the transfer opening is narrower than the lens optic in unstressed state.

69. The device of claim 63, wherein the receptacle is generally tube shaped with an interior duct, defining a duct axis.

70. The device of claim 31, wherein the transfer opening extends on the tube periphery substantially parallel with the duct axis.

71. The device of claim 69, wherein the duct diameter is less than the unstressed optic diameter.

72. The device of claim 63, wherein the receptacle is an implanter, or part of an implanter, designed for insertion of the lens into the eye.

73. The device of claim 72, wherein the implanter has a plunger arrangement for moving the lens.

74. The device of claim 73, wherein the plunger arrangement comprises a flexible sheet arranged for at least partly encircle the lens optic.

75. A device for stretching the haptics of a deformable intraocular lens, the lens in undeformed state comprising a) a roughly disc shaped optic part, defining an optic plane and a concentric optic axis normal to the plane, configured to act as a lens when inserted into an eye and b) at least two elongated haptic legs, each leg having an inner end attached to the optic part, an outer end being free and intermediate points in between the inner end and the free end, each leg being curved in unstressed state, the curvature defining a curve plane for each leg, and being flexible to at least a less curved configuration under stress, c h a r a c t e r i z e d i n the improvement comprising i) at least two haptic guiding surfaces arranged for each of the at least two haptic legs, the guiding surfaces having less curvature than the legs in un-stressed state, ii) a seat for the lens arranged with respect to the guiding surfaces so as to allow, when a lens is positioned in the seat, contact between a first point on the leg and its guiding structure and iii) a transfer opening allowing passage of the lens with the haptics, having said less curvature, to a receptacle.

76. The device of claim 75, having any of the characteristics of claims 1 to 74.